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263. Proposed by O. E. GLENN, Ph. D., Springfield, Mo.

Express the transcendentals e and π in the form of infinite continued fractions.

264. Proposed by O. E. GLENN, Ph. D., Springfield, Mo.

Express the invariant $2(a_0a_4 - 4a_1a_3 + 3a_2^2)$ of the binary quartic $a_0x_1^4 + 4a_1x_1^3x_2 + 6a_2x_1^2x_2^2 + 4a_3x_1x_2^3 + a_4x_2^4$ in terms of roots of the latter.

AVERAGE AND PROBABILITY.

177. Proposed by J. EDWARD SANDERS, Reinersville, Ohio.

Two random planes cut a given sphere. What is the chance that they intersect within the sphere?

CALCULUS.

220. Proposed by C. N. SCHMALL, College of the City of New York, New York City.

To determine the least polygon of n sides that can be described about a given circle.

DIOPHANTINE ANALYSIS.

135. Proposed by A. H. HOLMES, Brunswick, Maine.

In the equation in Diophantine Analysis: $2x^2 + 2x + 1 = \square = u^2$, show that u is always the sum of two squares.

136. Proposed by A. H. HOLMES, Brunswick, Maine.

Given $7x^2 - 111 = y^2$. Required a value for y greater than unity which shall be a prime integer.

GEOMETRY.

288. Proposed by C. N. SCHMALL, College of the City of New York, New York City.

From a point P on a given circle to draw two chords such that, (α) chord PA : chord $PB = m : n$ (a given ratio), and, (β) arc PA : arc $PB = 1 : 3$.

289. Proposed by J. J. QUINN, Ph. D., Warren, Pa.

(a) Suppose a circle described around the origin. Then at the end of a uniformly revolving radius r , a line equal to the diameter is pivoted. Find the equation of the locus of its extremity, if for every unit of angle its projection on the X axis is a constant linear unit, being the same part of the diameter as the angle is of π radians.

(b) Show how it can be applied to the trisection or multisection of an angle.